

A NEW COMBINATION IN SYZYGIUM FOR EUGENIA MAIRE
(MYRTACEAE) OF NEW ZEALAND

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THE LINNAEAN GENUS *Eugenia* has traditionally embraced a very large and varied assemblage of tropical and subtropical shrubs and trees fairly evenly divided in numbers between the Old and New Worlds. However, "most recent authors tend to segregate *Syzygium* from *Eugenia* s.l. and occasionally to accept a number of other Old World segregates: most notably *Acmena*, *Piliocalyx*, *Acicalyptus*, *Aphanomyrtus*, *Cleistocalyx*, *Cupheanthus* . . . , *Jambosa*, *Jossinia* and *Pareugenia*" (Schmid, 1972a). The majority of these segregate genera are founded on solitary or inconsistent characters and are not widely accepted. Schmid (1972a) assembled the available evidence and thoroughly discussed the characters used to separate *Syzygium* Gaertner sensu lato from *Eugenia* sensu stricto, including several anatomical ones resulting from his own studies. Schmid (1972b) accepted *Acmena* DC. and *Syzygium* as exclusively Old World segregates of *Eugenia* and relegated *Acicalyptus* A. Gray, *Cleistocalyx* Blume, *Caryophyllus* L., and *Jambosa* DC. to synonymy under *Syzygium*. *Eugenia* as thus circumscribed is concentrated in tropical America but with series *Jossinia* (DC.) Niedenzu in the Old World tropics.

The affinities of the endemic New Zealand species *Eugenia maire* have been considered by several workers who studied wood or bark anatomy or pollen morphology. Ingle and Dadswell (1953) discussed wood anatomy characters that separate *Eugenia* "A" from *Syzygium* sensu lato and *Eugenia* "B," and placed *E. maire* in the latter group. *Eugenia* "B" referred to species of *Eugenia* that would be better placed in *Syzygium*. Chattaway (1959) obtained similar results from a study of bark anatomy. Pike (1956) described pollen of 33 species of *Eugenia* sensu lato, mostly from the Old World. The three species of *Eugenia* "A" that she studied, none of which came from America, had longicolpate pollen, whereas her examples of *Acmena*, *Cleistocalyx*, *Eugenia* "B," *Jossinia* DC., *Piliocalyx* Brongniart & Gris, and *Syzygium* had either syncolpate or parasyncolpate pollen. McIntyre (1963) reported that pollen of *E. maire* is similar to that of *Cleistocalyx*, *Eugenia* "B," and *Syzygium*. At our request Dr. N. T. Moar has examined pollen of *Acmena smithii*, *Cleistocalyx longiflorus*, four species of *Eugenia* sensu stricto from America (including the type species), *E. maire*, *E. rariflora* (series *Jossinia*), and eight species of *Syzygium* (including the type species). Among these species there were no clear distinctions between genera. The pollen of *E. maire* shares features with *Cleistocalyx longiflorus* and some species of *Syzygium* and *Eugenia*, but not with *Acmena smithii* and *E. rariflora* (N. T. Moar, pers. comm.). Pollen of 32 species of *Eugenia* from central Brazil studied by Barth and Barbosa (1972) ranged from brevicolpate through parasyncolpate to syncolpate, a range of variation suggesting that Pike (1956) and McIntyre

(1963) were premature in accepting the nature of the colpi as a generic character in the Eugeniinae.

We have examined *Eugenia maire* with respect to most of the characters listed by Schmid (1972a), including all of the morphological and anatomical characters he considered significant in distinguishing between *Syzygium* sensu lato and *Eugenia* sensu stricto. Our findings, together with a summarized form of Schmid's most significant diagnostic characters, are presented in TABLE 1. We found no pentamerous perianths among the flowers of a very small sample of *E. maire*; therefore, this inconclusive result is not included in the table. However, the specimens examined by Gray (1854) had the calyx margin obscurely five-toothed; he placed *E. maire* in *Eugenia* § *Syzygium*.

Schmid (1972a) considered the pathway of the vascular supply to the ovules to be the most important of his list of diagnostic characters, *Eugenia* sensu stricto having a transeptal supply and that of *Syzygium* sensu lato being axile. Serial transverse sections of *E. maire* buds (stained with safranin and fast green) showed the following floral vascular structure (terminology follows Schmid, 1972b), diagrammatically represented in FIGURE 1. The floral tube bundles are in a monocyclic arrangement. Sclerenchyma is present as fibers, especially on the outer side of the floral tube bundles. The ovular supply is axile, formed from the coalescence of inwardly directed traces originating from the floral tube bundles low in the pseudopedicel. The axile ovular strand divides parallel to the septum

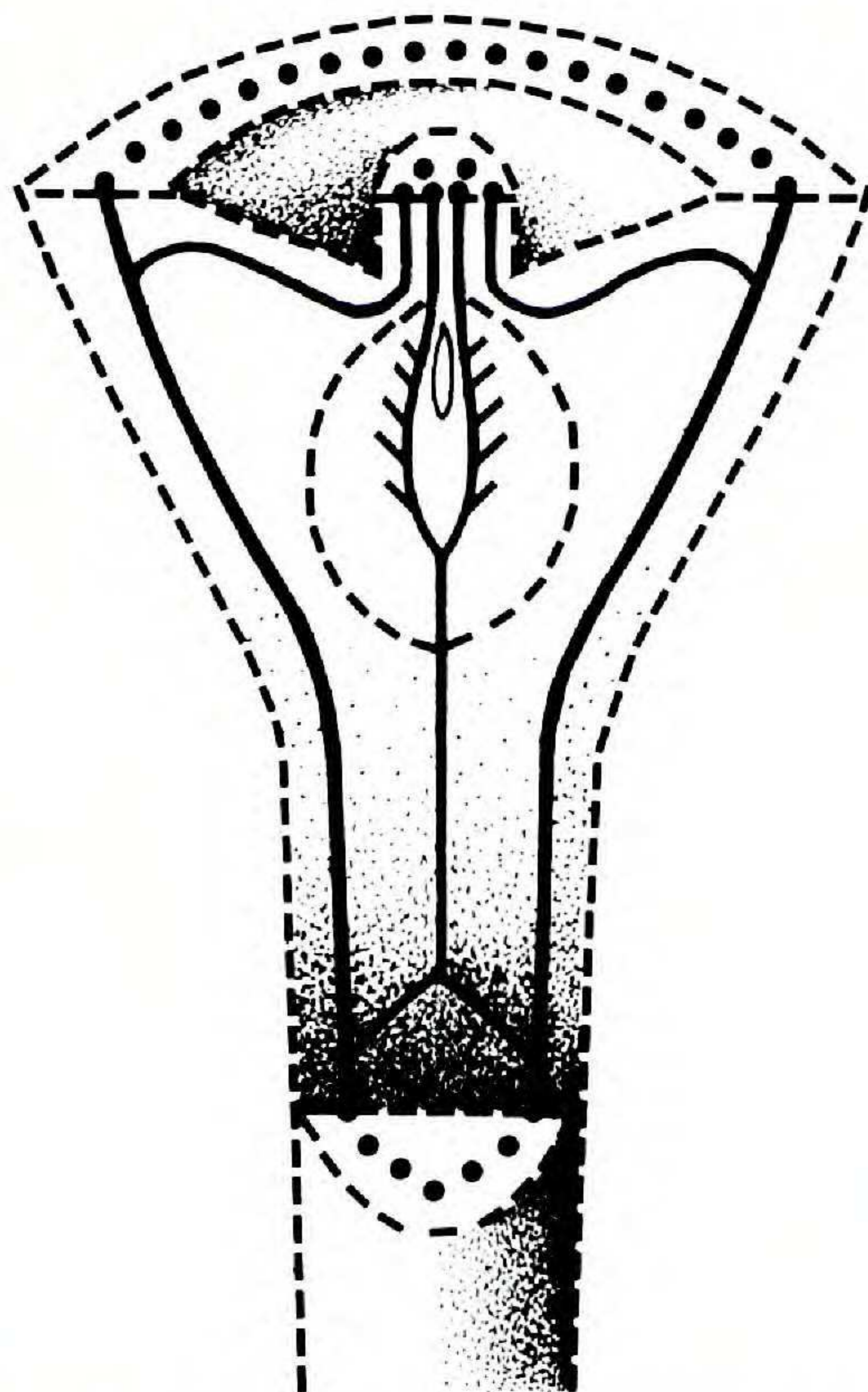


FIGURE 1. *Eugenia maire*: bud, sectioned transversely through base of style and base of pseudopedicel, longitudinally through septum (diagrammatic).

TABLE 1. Characters used to separate *Syzygium* from *Eugenia** and their states in *E. maire*.

	<i>Eugenia</i> sensu stricto	<i>Syzygium</i> sensu lato	<i>E. maire</i>
Pubescence on vegetative and/or reproductive parts	Present on most species	Present on very few species	Absent
Position of inflorescence	Predominantly lateral	Usually terminal	Terminal
Structure of inflorescence	Solitary flowers or usually racemes	Solitary flowers, panicles, cymes	Cymes
Bracteoles subtending flowers	Mostly persistent and conspicuous	Mostly fugacious and inconspicuous	Fugacious, inconspicuous
Pseudopedicel (attenuate flower base)	Rarely present	Mostly present	Present
Corolline or calycine calyptrae	Absent	Often present; mostly corolline	Present; corolline
Cotyledons	Usually fused	Usually distinct	Distinct
Large bundles of floral tube	Monocyclic	Mono- to mostly zonocyclic	Monocyclic
Number of bundles if pattern monocyclic	Definite, usually 8	Indefinite	Indefinite
Pathway of vascular supply to ovules	Transeptal	Axile	Axile
Texture of ovarian tissue	Compact	Usually spongy	Spongy

* From Schmid, 1972a.

in the lower part of the ovary. Repeated branches from these two ovular strands supply the ovules without forming a discrete placental ring. The two major branches of the axile ovular supply skirt the compitum by following the remnants of the septum, and continue upward into the lower part of the style. They are joined at the base of the style by about six carpellary traces originating from the vascular cylinder above the ovary.

The characters in TABLE 1, especially the axile ovular supply, show that the closest affinities of *Eugenia maire* are with those Indo-Malaysian and West Pacific species that have already been transferred to *Syzygium* sensu stricto. *Eugenia maire* approaches *Acmena* in its monocyclic arrangement of floral tube bundles and lack of a placental ring, but these features are also found in a number of species of *Syzygium* (Schmid, 1972b); *E. maire* cannot be placed in *Acmena* because its anther sacs are parallel and dehisce by lateral slits. Other segregates of *Syzygium* sensu lato and the main characters they are based upon (none of which are shared with *E. maire*) are *Acicalyptus* (calyx calyptrate), *Aphanomyrtus* Miquel (stamens eight or fewer), *Cupheanthus* Seemann (calyx tube 2.5–6 cm. long), *Cleistocalyx* (calyx calyptrate), *Jambosa* (petals free), *Par-eugenia* Turrill (stamen filaments fused in groups), and *Piliocalyx* (calyx calyptrate). The calyptrate corolla and incurved stamens of *E. maire* are illustrated in FIGURE 2.

Many of the necessary combinations in *Syzygium* have been made, notably by E. D. Merrill and L. M. Perry and later by Perry alone, in a series of papers quoted by Schmid (1972a). Most of these were regional monographs; there is no monograph of the genus. The solitary New Zealand species has remained in *Eugenia* since it was described.

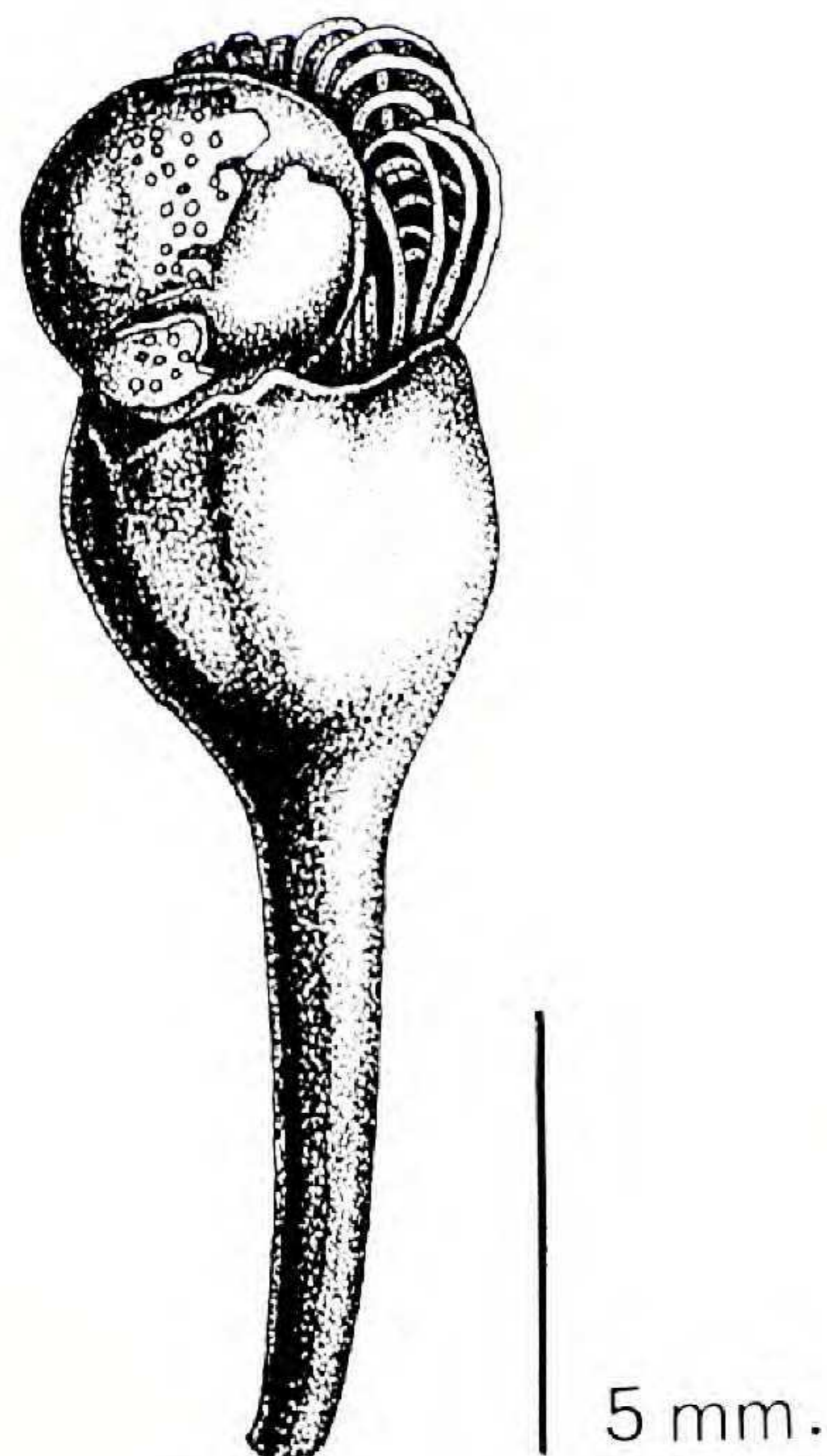


FIGURE 2. *Eugenia maire*: bud at anthesis.

Syzygium maire (A. Cunn.) Sykes & Garnock-Jones, comb. nov.

Eugenia maire A. Cunn. Ann. Nat. Hist. 3: 114. 1839. LECTOTYPE: "New Zealand, R. Cunningham, 1834" (K; photograph seen).

Although in the protologue A. Cunningham cited "New Zealand (Northern Island). Alluvial banks of rivers, Bay of Islands, & c. — 1833, R. Cunningham," there are no specimens so labeled at Kew, and none dated 1833 (G. E. Wickens, pers. comm.). The specimen chosen by Allan (1961) as lectotype bears the number 564, which corresponds with the number of the species in Cunningham's protologue; consequently we have followed Allan's choice.

Two other New Zealand species originally placed in *Eugenia*, *E. obcordata* Raoul and *E. vitis-idaea* Raoul, were transferred to the endemic genera *Lophomyrtus* and *Neomyrtus*, respectively, by Burret (1941). Both genera are segregates of *Myrtus*. Their fruits contain a number of small seeds (rarely as few as two) with curved embryos, as opposed to the one or two large seeds with straight embryos in *Eugenia* and *Syzygium* fruits.

The recognition of the New Zealand maire tawake or black maire as a species of *Syzygium* extends the known range of that genus southward into the temperate South Pacific to about 41°S. In Australia the genus does not extend south of the subtropical rain forests of New South Wales, 35°S. *Syzygium* is indigenous in the Pacific as far east as Rose Island in American Samoa and, according to some authorities, Hawaii. Species of *Eugenia* series *Jossinia* are also indigenous to the tropical South Pacific, and one, *E. rariflora* Bentham, the type of which is from Fiji (sometimes included in *E. reinwardtiana* (Blume) DC.) extends across much of tropical Polynesia. Such species are shrubs, sometimes semiprostrate, or small spreading trees with axillary flowers, solitary or few together forming a small fascicle, with prominent petals and fused cotyledons. They are very distinct from any Polynesian or Fijian species of *Syzygium*.

Syzygium maire and some other species (including *Dysoxylum spectabile* (Forster f.) Hooker f., two species of *Elaeocarpus* L., *Litsea calicularis* (A. Cunn.) T. Kirk, *Planchonella novo-zelandica* (F. Mueller) Allan, and *Schefflera digitata* J. R. & G. Forster) are outliers in New Zealand of large widespread genera in the Indo-Malaysian and tropical West Pacific regions. They are mostly lowland North Island trees and provide evidence of an affinity between the floras of New Zealand and the tropical regions to the north and northwest.

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To all these people we express our thanks.

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